

CLAIMS:

1. A closure assembly of an opening of or in a building or like structure, said closure assembly including at least two mutually pivoted panels (glazed or otherwise) mounted with the mutual pivot axis at least substantially vertical and so
5 as to be movable between:

(i) a closed condition whereby said at least two panels at least substantially in mutual alignment provide at least a partial closure of said opening in or substantially parallel to the plane of the opening, and

(ii) an opened condition whereby said at least two panels, mutually
10 disaligned by having pivoted mutually towards each other, are substantially clear of the plane of the opening and where one of each, or all of at least two panels, lie at an acute angle or parallel with respect to the plane of the opening,

wherein one of said panels (the "proximate panel") is pivoted by an at least substantially vertical pivot axis substantially in the plane of the opening at and/or
15 adjacent a vertical periphery of said opening ("the proximal periphery"),

and wherein the distal region of the other panel (the "distal panel") is supported by at least one supporting runner,

wherein the supporting runner running on a support track which, at least in part is skewed, angled or angling, cranked or curved (hereafter "skewed") with
20 respect to the plane of said opening, has the affect of spacing the supporting runner out of the plane of said opening at/or adjacent said proximal periphery.

2. A closure assembly as claimed in claim 1 wherein the proximate panel is pivoted by a substantially vertical pivot axis fixed relative to said opening.

3. A closure assembly as claimed in claim 1 wherein said proximate panel is
25 pivoted by a substantially vertical pivot axis horizontally movable relative to and within the plane of the opening.

4. A closure assembly as claimed in claim 1 wherein said supporting runner includes a wheeled bogie engaged with the support track.

5. A closure assembly as claimed in any one of claims 1 to 4 wherein said
30 support runner includes a vertical axis pivot to allow said wheeled bogie to pivot relative to said distal panel about a vertical axis.

6. A closure assembly as claimed in claim 5 wherein said vertical axis of said pivot of said wheeled bogie is located at the mid thickness of said distal panel.

7. A closure assembly as claimed in any one of claims 1 to 6 wherein the support track is substantially rectilinear in form and is at an acute angle with respect
5 to the plane of the opening.

8. A closure assembly as claimed in any one of claims 1 to 6 wherein the support track is at least in part rectilinear in form and said part is at an acute angle with respect to the plane of the opening.

9. A closure assembly as claimed in any one of claims 1 to 6 wherein the
10 support track is rectilinear in form and parallel with the plane of the opening (preferably in the plane of the opening) save for that part thereof immediately proximal to the proximal periphery, where said track is angled to the plane of said opening to step the supporting runner out of the plane of the opening.

10. A closure assembly as claimed in any one of claims 1 to 6 wherein the
15 support track is curved.

11. A closure assembly as claimed in any one of claims 1 to 10 wherein the distal region of the distal panel is supported by one supporting runner affixed at either the top or bottom (the "vertical supported location") of the distal panel.

12. A closure assembly as claimed in claim 11 wherein the other of said top or
20 bottom to said vertical supported location is associated with a guiding runner tracked by a guiding track in the plane or parallel to the plane of the opening, such guiding runner nevertheless allowing by means of an extensile association of the guiding runner with the distal panel, movement for the distal panel in following the support track defined locus allowing the distal region of the distal panel to move as
25 guided and pivoted with respect to the opening by the supporting runner guided by the support track.

13. A closure assembly as claimed in claim 11 or 12 wherein the other of said top or bottom to said vertical supported location is associated with a guiding runner tracked by a guiding track in the plane or parallel to the plane of the opening, such
30 guiding runner including an extensile arm pivotally attached to the distal panel, said extensile arm allowing the following of the support track defined locus required to

allow the distal region of the distal panel to move as constrained by said support track.

14. A closure assembly as claimed in any one of claims 12 or 13 wherein the guiding runner includes an articulation means extending in a pivotal manner
5 between the distal panel (at or towards the distal region) said articulation means being further pivotally associated with said guiding track via a runner bogie located with and guided by the guiding track, thereby providing said extensile association.

15. A closure assembly as claimed in claim 14 wherein said articulation means is a rigid arm.

10 16. A closure assembly as claimed in claim 15 wherein said rigid arm extends perpendicular to said plane of said opening when said panels are in said open condition.

17. A closure assembly as claimed in any one of claims 1 to 16 wherein the support runner is provided at the top of the distal panel.

15 18. A closure assembly as claimed in any one of claims 12 to 17 wherein the guide runner is located at the bottom of the distal panel.

19. A closure assembly as claimed in any one of claims 12 to 17 wherein the guide runner is provided at the top of the distal panel and the supporting runner is located at the bottom of the distal panel.

20 20. A closure assembly as claimed in any one of claims 1 to 10 wherein the distal region of the distal panel is supported by a top and bottom located supporting runner, each supporting runner running in a respective said support track, disposed at the top and bottom of the opening.

21. A closure assembly as claimed in any one of claims 1 to 20 wherein the
25 proximal panel is pivoted by a fixed vertical pivot axis at the proximal periphery.

22. A closure assembly as claimed in any one of claims 1 to 21 wherein said panels in an open position, lie substantially parallel to the plane of the opening.

23. A closure assembly as claimed in any one of claims 1 to 22 wherein the closure assembly is fully framed.

30 24. A closure assembly as claimed in any one of claims 1 to 22 wherein the perimeter of said closure assembly is defined by a frame structure of a size

commensurate to being received in said opening of or in said building or like structure.

25. A closure assembly as claimed in any one of claims 1 to 22 wherein the perimeter of said closure assembly is defined by a frame structure of a size
5 commensurate to being received in said opening of or in said building or like structure said frame including a top frame extrusion, and a bottom frame extrusion parallel to said top frame extrusion and to extend horizontally in use, and two side frame extrusions affixed to and extending between said top and bottom frame extrusion and parallel to each other and to in use extend vertically.

10 26. A closure assembly as claimed in any one of claims 23 to 25 wherein said frame is at least in part an assembly of extruded forms.

27. A closure assembly as claimed in any one of claims 1 to 26 wherein said supporting runner is a top runner affixed to a top or upper part of said distal panel, and wherein said opening of or in said building includes head framing, said support
15 track is incorporated in a head assembly, said head assembly including

a) a longitudinally extending foundation member to be fastened to the head framing of said opening with its longitudinal direction parallel to the plane of said opening,

b) a subassembly carrying the support track, fastened to said foundation
20 member yet in a manner to allow the displacement of the said support track in a manner selected from one or more of

(i) a linear manner to and from the bottom of said opening, and

(ii) a manner to allow the tilt of said track about a horizontal axis parallel to the plane of said opening.

25 28. A closure assembly as claimed in claim 25 wherein said supporting runner is a top runner affixed to a top or upper part of said distal panel, wherein said top frame member is a head assembly, said head assembly including

a) a longitudinally extending foundation member to be fastened to the building and in a manner with its longitudinal direction parallel to the plane of said
30 opening,

b) a subassembly carrying the support track, fastened to said foundation member yet in a manner to allow the displacement of the said support track in a manner selected from one or more of

- (i) a linear manner to and from the foundation member, and
- 5 (ii) a manner to allow the tilt of said track about a horizontal axis parallel to the plane of said opening.

29. A closure assembly as claimed in claim 28 wherein said foundation member is fixed to said side frame members.

30. A closure assembly as claimed in claims 28 or 29 wherein said subassembly
10 is engaged to said foundation member by two arrays of vertically extending adjustment screws, a first array and a second array parallel to each other and to the plane of the opening, wherein the differential adjustment of the screws in one array to the other array inducing said tilt and wherein corresponding adjustment of the screws in the first array and the second array inducing the linear displacement.

15 31. A closure assembly as claimed in claim 28 or 30 wherein said subassembly includes a pelmet with which said track is fastened and disposed therefrom in a manner to be exposed for engagement with the supporting runner.

32. A closure assembly as claimed in claim 31 wherein said pelmet extends outwardly from the plane of the opening sufficient to present from below thereof
20 said support track and to allow the spacing of the supporting runner to assume the opened condition.

33. A closure assembly as claimed in any one of claims 31 to 22 wherein said pelmet is an elongate substantially constant cross section extruded member.

34. A closure assembly as claimed in claim 33 wherein said pelmet includes
25 trimming panels on each side of said support track spanning the gap between said support track and the longitudinal edges of said pelmet.

35. A closure assembly as claimed in any one of claims 30 to 34 wherein said first array of fastening screws is provided parallel to and on a first side of said plane of said opening and the second array is provided parallel to and on the other side of
30 said plane of said opening.

36. A closure assembly as claimed in any one of claims 30 to 35 wherein said screws of each array are equispaced.

37. A closure assembly as claimed in any one of claims 1 to 36 wherein a locking pin is provided fixed to said structure, said locking pin positioned to engage at distal region of said distal panel against an outwardly facing surface of said distal panel when said panels are at and proximate to its closed condition to capture from moving outwardly.

38. A closure assembly as claimed in any one of claims 25 to 37 wherein a locking pin is provided fixed to said frame, said locking pin positioned to engage at distal region of said distal panel against an outwardly facing surface of said distal panel when said panels are at and proximate to its closed condition to capture said distal region against a jam portion of said frame to thereby prevent said distal region from moving outwardly.

39. A closure assembly as claimed in any one of claims 25 to 37 wherein said distal panel is supported at a top or bottom thereof by a said support runner and wherein at the other of said top or bottom the distal region of said distal panel includes an outwardly facing surface and wherein a locking pin is provided fixed to said frame structure, said locking pin positioned to engage the outwardly facing surface of said distal panel when said panels are at and proximate to its closed condition to capture said distal region against a jam portion of said frame to thereby prevent said distal region from moving outwardly.

40. A closure assembly as claimed in claims 38 or 39 wherein said outwardly facing surface is a concealed to the outside surface of said distal panel.

41. A closure assembly as claimed in any one of claims 1 to 40 wherein provided to the proximal periphery disposed region of said proximal panel on the to be distal panel facing side thereof when in the opened condition, is a first mutually attractive means, the distal panel being provided at a corresponding location to the location of said first mutually attractive means on a proximal panel facing side thereof when in the opened condition, with a second mutually attractive means to thereby allow the interaction of said mutually attractive means when said panels are in the opened

condition to encourage said distal region of said distal panel to remain engaged to the proximal periphery disposed region of said proximal panel.

42. A closure assembly as claimed in claim 41 wherein said first and second mutually attractive means are magnetically attractive means.

5 43. A closure assembly as claimed in claim 41 or 42 wherein said first and second mutually attractive means are both magnets.

44. A closure assembly as claimed in any one of claims 41 to 43 wherein said first and second mutually attractive means are positioned towards the bottom of said panels.

10 45. A bifold door and/or window structure
at least a proximal panel and a distal panel
wherein

(a) the distal panel is provided at/or adjacent a lower distal region with a pivot on an extension of or from a lower track runner tracked in the plane of the
15 opening to be closed by the door and/or window panels and,

(b) the distal panel is provided at or adjacent an upper distal region with a means to provide pivot tracking from a support track of the structure, said support track being skewed at least in part (whether straight, curved, kinked or otherwise)

and wherein together (a) and (b) have the affect of moving a thus defined
20 common distal pivot axis of the distal panel out of the plane of the opening as the panels are opening thereby to allow the bifold door or window structure concertina back away from the opening with the proximal panel adjacent the building structure and the distal panel adjacent the proximal panel.

46. A guiding runner for supporting a lower distal region of distal panel of a
25 bifold or multi-fold door and/or panel structure from a track, said guiding runner having an arrangement adapted to pivotally attach to said distal region of said distal panel,

a runner adapted to track said track, and

a link between the pivotal attachment and the runner, said link including two
30 substantially parallel pivot axes whereby the link can range in its disposition from being aligned or substantially aligned in the plane of the tracking locus or extend

outwardly therefrom to effectively space the pivot most proximal to the door and/or window panel from such plane of the tracking locus.

47. A guiding runner as claimed in claim 46 wherein such a guiding runner is substantially as hereinafter described with reference to any one or more of Figures
5 1B, 2, 3, 5, 6A-C, 11, 12.

48. Extrusions for framing an opening in a structure and for providing tracks for such a structure, wherein in subassembly or assembly they are adapted to form part of an assembly or structure of the closure assembly as claimed in any one of claims 1 to 44.

10 49. In a building structure, a pair of tracks at an opening for a bifold or the like panel assembly, the lower track being in the plane of the opening and the upper track being skewed outwardly of the plane of the opening.

50. A bifold door and/or window structure comprising
at least a proximal panel and a distal panel

15 wherein

(a) the distal panel is provided at/or adjacent a lower or upper distal region with a pivot on an extension of or from a guiding track runner tracked in the plane of the opening to be closed by the door and/or window panels and,

(b) the distal panel is provided at or adjacent the other of said upper or
20 lower distal region with a means to provide a pivot tracking from a support track of the door or window structure, said support track being skewed at least in part (whether straight, curved, kinked or otherwise)

and wherein together (a) and (b) have the affect of moving a thus defined common distal pivot axis of the distal panel out of the plane of the opening as the
25 panels are opening thereby to allow the bifold door or window structure concertina back away from the opening with the proximal panel adjacent the building structure and the distal panel adjacent the proximal panel.

51. A guiding runner for supporting a lower or upper distal region of distal panel of a bifold or multi-fold door and/or panel structure from a track, said guiding
30 runner having an arrangement adapted to pivotally attach to said distal region of said distal panel,

a runner adapted to track said track, and

a link between the pivotal attachment and the runner, said link including at least two substantially parallel pivot axes whereby the link can range in its disposition from being aligned or substantially aligned in or acute to the plane of the tracking locus when said bifold door is closed or extend outwardly therefrom to effectively space the pivot most proximal to the door and/or window panel from such plane of the tracking locus.

52. A guiding runner as claimed in claim 51 wherein such a guiding runner is substantially as hereinafter described with reference to any one or more of Figures 10 1B, 2, 3, 5, 6A-C, 11, 12.

53. Extrusions for framing an opening in a structure and for providing tracks for such a structure, wherein in subassembly or assembly they are adapted to form part of a closure assembly as claimed in any one of claims 1 to 44.

54. In a building structure, a pair of tracks at an opening for a bifold or the like panel assembly, a first of said tracks positioned either as a lower or upper track and being in the plane of the opening and the second of said tracks being opposite to the first of said tracks being skewed outwardly of the plane of the opening.

55. In a building structure, a pair of tracks at an opening or a bifold or the like panel assembly, the upper track being in the plane of the opening and the lower track being skewed outwardly of the plane of the opening.

56. A pair of tracks as claimed in claim 55 wherein said such track is of a kind capable of being used in a closure assembly as claimed in any one of claims 1 to 44.

57. A building including a closure assembly to an opening of said building, said closure assembly including at least two mutually pivoted panels (glazed or otherwise) mounted with the mutual pivot axis at least substantially vertical and so as to be movable between:

(i) a closed condition whereby said at least two panels at least substantially in mutual alignment provide at least a partial closure of said opening in or substantially parallel to the plane of the opening, and

30 (ii) an opened condition whereby said at least two panels, mutually disaligned by having pivoted mutually towards each other, are substantially clear of

the plane of the opening and where one of each, or all of at least two panels, lie at an acute angle or parallel with respect to the plane of the opening,

wherein one of said panels (the "proximate panel") is pivoted by an at least substantially vertical pivot axis substantially in the plane of the opening at and/or
5 adjacent a vertical periphery of said opening ("the proximal periphery"),

and wherein the distal region of the other panel (the "distal panel") is supported by at least one supporting runner,

wherein the supporting runner running on a support track which, at least in part is skewed, angled or angling, cranked or curved (hereafter "skewed") with
10 respect to the plane of said opening, has the affect of spacing the supporting runner out of the plane of said opening at/or adjacent said proximal periphery.